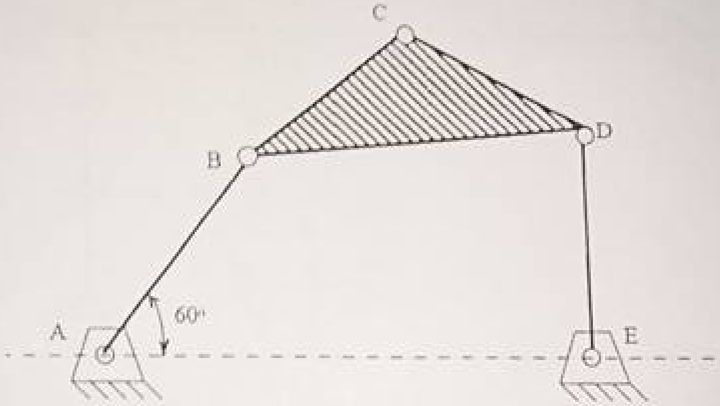
Sheet 2 (Velocity and Acceleration)

Q1.

In the mechanism shown below, link AB is rotating CW at constant rate of 10 rad/sec.

Determine, using the graphical method, the angular velocity of both the ternary link BCD and the binary link DE. Find also the angular acceleration of both links.

What are the linear velocity and linear acceleration of point C?

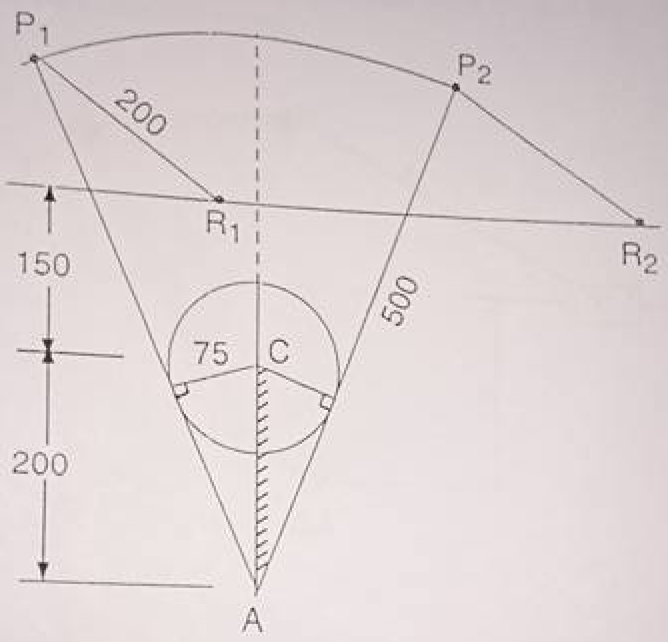


[Given that: AB = DE = 1 m, BC = CD = 0.8 m, AE = 1.5 m]

BD=1.5m

Q2.

In a crank and slotted lever quick return mechanism, as shown in Fig. 5.37, the iving crank length is 75 mm. The distance between the fixed centers is 200 mm and e length of the slotted lever is 500 mm. Find the ratio of the times taken on the tting and idle strokes. Determine the effective stroke also.

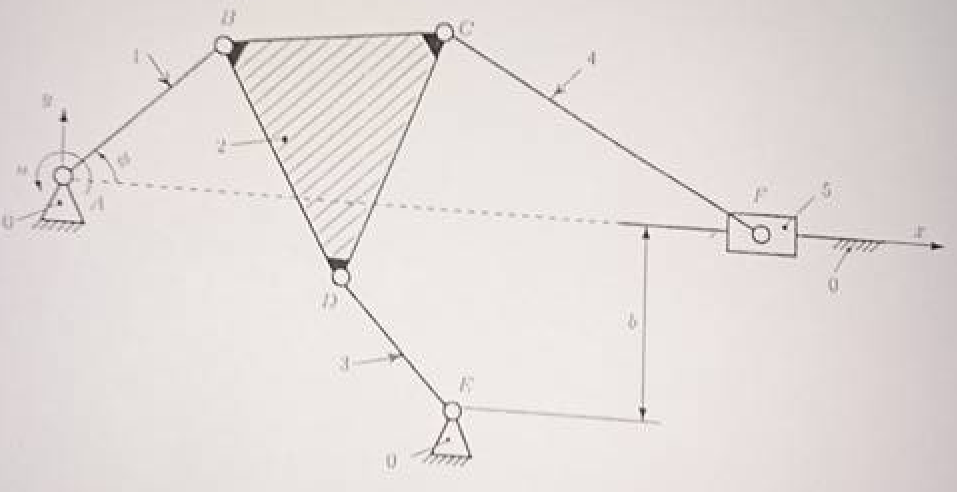


Q3.

The dimensions for the mechanism are:

AB = 250 mm, BD = 670 mm, DE = 420 mm, AE = 640 mm, BC = 240 mm, CD = 660 mm, CF = 850 mm, and b = 170 mm.

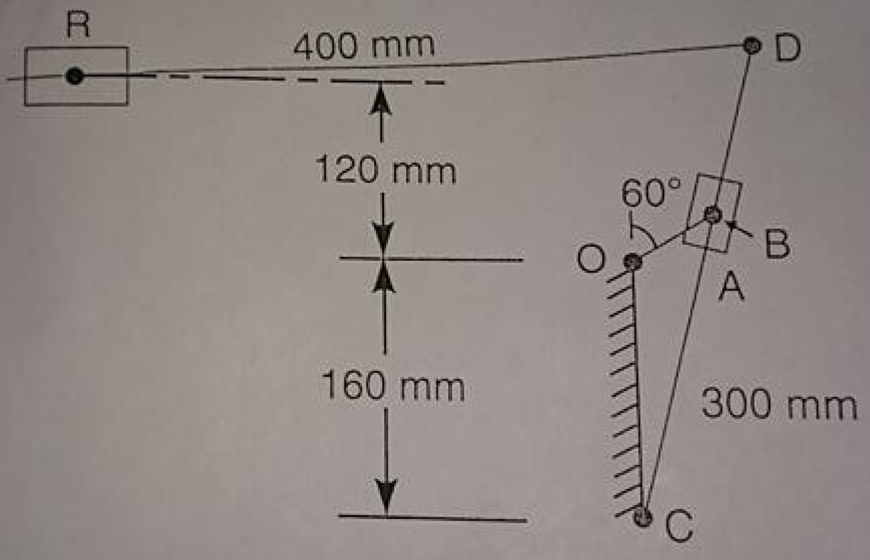
The angle of driver link 1 with the horizontal axis is $\phi = \phi_1 = 30°$. Find the positions of the joints and the angles of the links.



Q7.

The figure shows a quick return mechanism shown, the driving crank is 60 mm and rotates at a uniform speed of 200 RPM in a clockwise direction.

Find The velocity and acceleration of slider R. and acceleration of the sliding block along the slotted bar CD



Q7.

The figure shows a mechanism with the following dimensions:

$AB = 40$ mm, $BC = 100$ mm, $AD = 50$ mm, and $BE = 110$ mm. The constant angular speed of the driver link 1 is $n = 250$ rpm.

Find the velocities and the accelerations of the mechanism if the angle of the driver link 1 with the horizontal is $\varphi = 30°$.

